Micro Focuser

ANALOGIC PC & BIG 35 Analogic_PC

USER MANUAL

ASCOM V1 COMPATIBILE

INSTALLATION

Mechanics – Schmidt-Cassegrain

The Micro Focuser Analogic (MFA_PC) are designed to be compatible with most telescope with a standard 2 inches barrel, like Schmidt-Cassegrain instruments. The threaded ring must be removed by hand from the focuser and attached firmly to the telescope. Now the MFA_PC focuser can be applied to the telescope, rotating it if needed and block it using the three thumbscrews near the base of the focuser. Along with the MFA_PC two adapters (optional) , the first permits to insert eyepieces and accessories with a diameter of 1¼", the seconds is designed for 2" accessories.

Mechanics – Newton and BIG 35 Analogic_PC

This focuser supports the same accessories of the previous model, not a Micro Focuser BIG 35 Analogic_PC (subsequently appointed BIG35A). To mount the focuser to the telescope use the supplied plate attaching it with screws at the same place of the previous focuser of the telescope. Before mounting the MFA_PC it is mandatory to securely attach the plate to the base of the focuser using the 4 thumbscrews supplied.

Electronics

The MFA_PC or BIG35A are supplied with a cable for the power supply marked by a yellow or white stripe. Optionally it's available a power supply with an universal input (110/240 Vac 50/60 Hz). The 8-pins cable between the controller and the focuser is approx. 2 meters long. The RS232 6-pins cable is 5 meters long (maximum length: 15 m) and must be connected between the controller and the PC, using the DB9 adapter. We recommend to connect the all the cables before turning on the focuser. If a different power supply is used then it's mandatory to verify the following specifications: minimum Vcc: 9 Volt, maximum: 14 V. At least 0.5 Ampere for the current.

CONTROLLER AND COMMANDS

NEW HAND CONTROLLER

- **Power on:** Press the central button (**PWR**)
- **Manual power off:** Keep pressed the button **PWR** until all leds are off.
- **Automatic power off:** This function is enabled if the led of the speed blinks (**MOTOR SPEED %**). To enable this function press the button **PWR** until the led stars blinking. When the focuser is controlled by the PC this function is automatically disabled. To disable this function keep pressed the button **PWR** until the led stops blinking.
- **Calibration:** This function brings the focuser to the half of its run, a known position which will can be used as reference. To enable this function power off the focuser (keeping pressed the button **PWR** until all leds are off), then power it on (always pressing the **PWR** button and waiting until the speed leds are on) then press again **PWR** while the leds starts going off.
- **Speed selection:** Press the button **SPEED** to change it, the speed is indicated by the leds and it's expressed as percentage relative to the maximum.

- **Moving forward:** keep pressed the button **IN**. If the button is pressed for an instant then the focuser will be moved by a fixed small step.
- **Moving backward:** keep pressed the button **OUT**. If the button is pressed for an instant then the focuser will be moved by a fixed small step.
- **Indication of end of run:** both leds (in and out) start blinking when the focuser has reached its maximum or minimum position. The motor will stop moving.
- **Indication of low battery:** all leds start blinking when the voltage becomes too low, when the focuser is powered by a battery. The battery must be replaced.

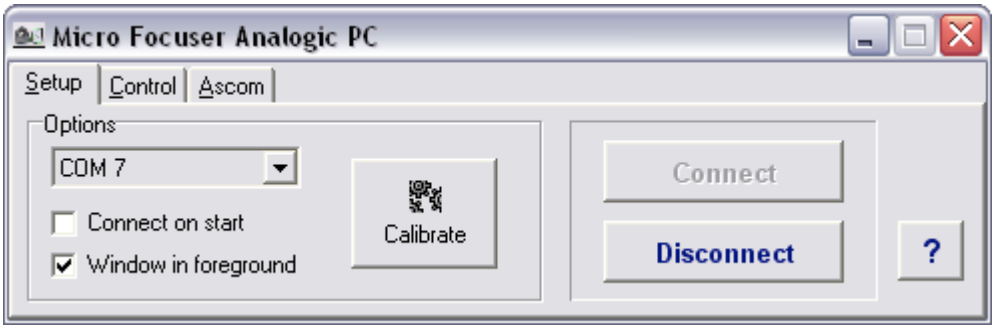
Attention

The MFA_PC focuser with firmware version 1.1 has a more powerful motor which needs more energy, so it cannot be powered by small internal batteries. The firmware version is written in this manual and in the PC software click the button **"?"** in the **Setup** page. An internal battery can be inserted anyway, but its duration would be very short and may not be sufficient to move the focuser.

PC CONTROL

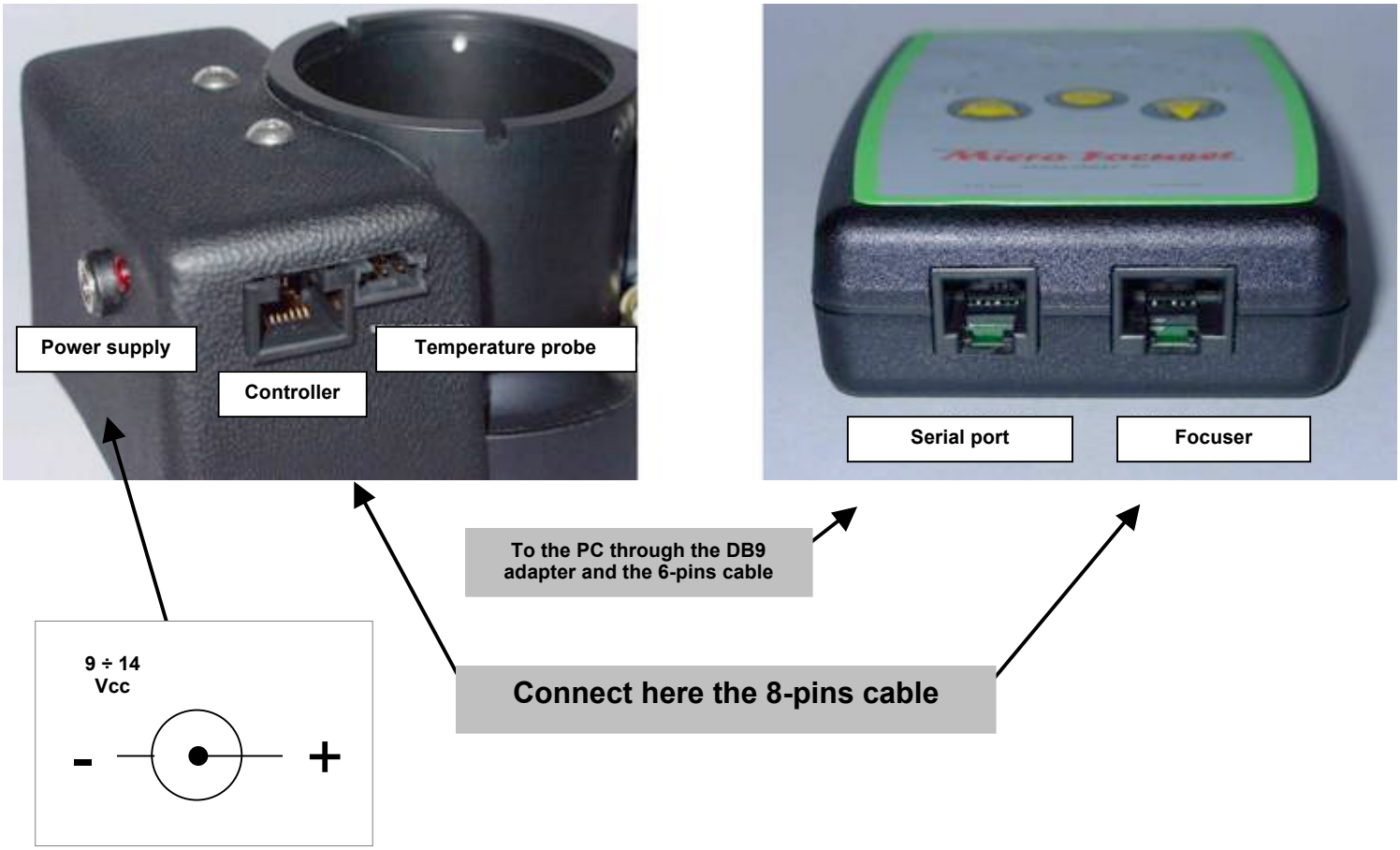
This section explains how to operate the MFA_PC or BIG35A from any Personal computer running Windows™ 98, Me, 2000, XP. This function is very useful when combined with CCD cameras or when the astronomical instruments must be controlled remotely. Now compatible with **ASCOM** platform.

The **"SETUP"** page let the user to choose the correct communication port and connect or disconnect the focuser. To connect automatically when the program is executed enable the option "Connect on start". To keep the program window always in foreground (e.g. above other programs)

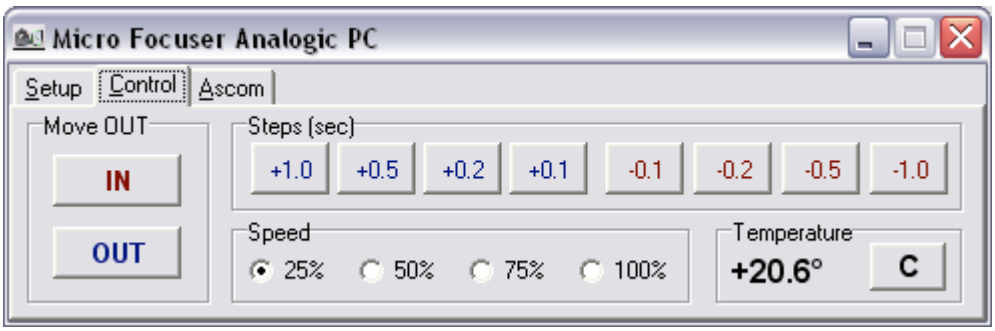


enable the option "Window in foreground". The button "Calibrate" starts the automatic calibration.
Attention !!! Be careful about cables and connections. A wrong wiring may damage the focuser or the serial port of the PC. See the following scheme.

CONNECTION SCHEMATICS



The **"CONTROL"** page let the user to control the focuser.



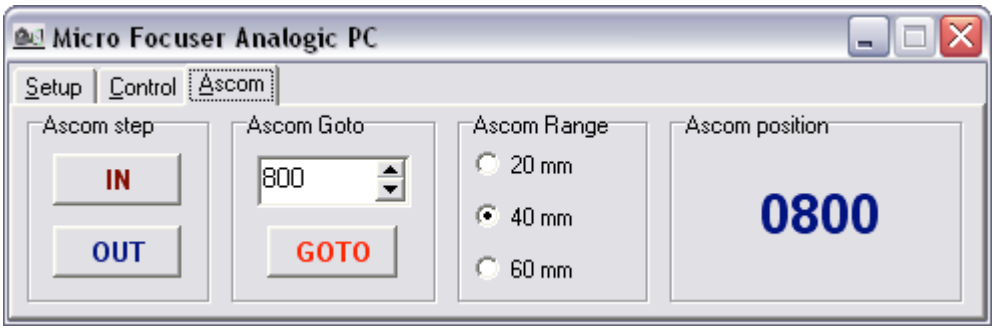
- **Steps (sec):** This section contain some button to move the focuser by a fixed amount of time (seconds). The effective step of the focuser depends also by the current speed (see below), this means that 16 steps are possible (4 steps by 4 speeds). The buttons with a red title and a

negative value move the focus inside (IN). The buttons with a blue title and a negative value move the focus outside (OUT).

- **Speed:** This panel changes the focuser speed, expressed as percentage of the maximum speed of the motor.
- **IN:** This button moves the focuser inside, at the current speed. The focuser keeps moving until the button remain pressed. After the last pressure in this direction it appears, to flank of the written one **Moves**, the written **IN**.
- **OUT:** This button moves the focuser outside, at the current speed. The focuser keeps moving until the button remain pressed. After the last pressure in this direction it appears, to flank of the written one **Moves**, the written **OUT**.
- **Temperature:** This panel shows the current ambient temperature. Click the button it's possible to switch between Celsius and Fahrenheit.
- **?: (setup page)** Shows a dialog window with the firmware version and the microprocessor version.

Driver for the Ascom platform

The version 2.0 of the control software is compatible with **Ascom standard** http://ascom-standards.org , this makes the focuser controllable from any software which implements this platform. The main purpose is automatic focusing using an imaging and a focusing program like for example Maxim DL/CCD. The Microfocuser will be listed in the box "focuser" at the page **Setup** of the menu **View** → **Telescope Control Window**.



In the Ascom page of the software it's possible to choose the focuser model (20 for Schmidt-Cassegrain, 40 and 60 for Newton) inside the panel "**Ascom Range**". Remember to perform the calibration if you modify this setting, which brings the focuser to half of its travel distance, for example at 20 mm for the Newton 40mm.
The buttons IN and OUT in the panel "**Ascom step**" move the focuser step by step, every step is long 7 ms (approx. 100 μm) for the focuser release 1.2 or 3 ms (approx. 30 μ/m) for release 1.3.
In the panel "**Ascom Goto**" it's possible to move the focuser to a given position.

Please note !!! The Ascom position displayed this way is calculated measuring the movement time, so it's approximate. The same numerical position may not be related to the same mechanical position.

TECHNICAL SPECIFICATIONS

ANALOGIC_PC S/C 20 mm, NW 40 mm – BIG35 40 mm

Focuser

Total travel distance mm	20 S/C – 40 NW
Total travel distance mm - **BIG 35**	40
Maximum load	3.2 ÷ 4.8 kg (depends by the tilt of the instruments)
Maximum load - **BIG 35**	13 ÷ 15 kg (depends by the tilt of the instruments)
Gear (motor)	Stainless steel
Gear (focuser)	Brass
Controller connector	1 x 8 pins RJ45
Temperature probe (optional)	Digital 9 bit, lin. ± 0,5°C (-0 / +70), cable 50 cm
Mechanical dimensions max.	92 x 86 mm (Ø x H)
Mechanical dimensions max. **BIG 35**	Ø 160 ; L 122 mm (40 mm), L 153 mm (60 mm)
Operating temperature °C	-25 / + 65
Calibration sensor	Hall effect / neodymium magnet
Weight	2,6 Kg. approx. (BIG 35) - A_PC 720 gr. (20 mm), 780 gr. (40 mm)

Hand Controller

CPU	RISC, PIC Microchip 18F876i
Technology	FLASH / EEPROM
CPU memory	FLASH 8K – 14 bit
Ram	368 bytes
EEPROM	256 bytes
Clock frequency	16 MHz
Power consumption max.	250 mA
Focuser connector	1 x 8 pin RJ45
PC connector	1 x 6 pin RJ11
PC cable, length	5 m – (15 m **BIG 35)**
Dimensions	(L)104 x (W)71,8 x (H)25,4
Operating temperature °C	-25 °C + 65 °C
Power supply	Internal battery 9 VDC (only on request) Extern 12 ÷ 14 VDC (from the focuser)

Optional power supply

Input	100~240 Vac, 47~63 Hz, 0.5 A
Output	12 VDC, 1.25 A, 15W max.
Connector	Coaxial plug 5.5 mm (positive in the middle)
Certificate	UL - CE - GS – CB

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CONNECTOR SCHEMATICS

CABLE AND SERIAL ADAPTER DESCRIPTION

RJ11 CONNECTOR	DESCRIPTION	DB9 SERIAL ADAPTER
1 WHITE	NC	1 NC
2 BLACK	GND	2 BLACK
3 RED	NC	3 RED
4 GREEN	RX 232	4 NC
5 YALLOW	TX 232	5 YELLOW
6 BLUE	NC	6,7,8,9 NC

HAND CONTROLLER CABLE DESCRIPTION

1	GRAY	GND
2	BROWN	MOTOR – NEGATIVE POLE
3	YALLOW	NC
4	GREEN	MOTOR - POSITIVE POLE
5	RED	NC
6	BLACK	TEMPERATURE PROBE
7	ORANGE	CALIBRATION SENSOR
8	BLUE	+ 12 ÷ 14 VCC